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ABSTRACT

According to New York State law, all school districts and BOCES are required to conduct annual visual structural inspections of all district owned educational facilities and in accordance to the "Guidelines for Visual Structural Inspections of Student Occupied Public School Buildings." This document presents the interim guidelines for these inspections. It addresses the steps for performing a visual structural inspection, including inspection team selection, gathering inspection materials and scheduling, pre-inspection meetings, the scope of the inspection related to structural integrity, the inspection team report, and the school board review and actions. The concluding section provides a glossary of terms. (GR)

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ED 428 513

October 14, 1998

**TO:** District Superintendents
Chancellor of the New York City School District
Superintendents of Schools

**FROM:** Charles A. Szuberla, Jr.

**SUBJECT:** Transitional Requirements for Annual Inspections of Instructional Buildings Owned by School Districts Pending Issuance of New Regulations

Chapter 55 of the Laws of 1998 added new Sections 409-d and 409-e to Education Law which establish a Comprehensive School Building Safety Program and Uniform Code of Public School Inspection Safety Rating and Monitoring. The Commissioner of Education is required to establish new regulations after holding a public hearing.

Pending new regulations, all school districts and BOCES are still required to conduct annual visual structural inspections of all district owned instructional buildings pursuant to Section 155.1(d) of the Regulations of the Commissioner of Education. Inspections conducted under the interim regulations will satisfy the requirements for annual building inspections until the new regulations become effective. In the event that a visual structural inspection discloses evidence of a defective structural condition, a licensed architect or professional engineer shall be retained **immediately** to inspect the condition and ascertain if structural modifications are necessary.

In school districts in cities having 125,000 inhabitants or more, the visual inspections shall be conducted in accordance with standards established by the Board of Education and submitted to and approved by the Commissioner of Education prior to the inspection.

Following is the procedure for making the visual inspection in districts other than cities having 125,000 inhabitants or more.

## VISUAL INSPECTIONS

Visual inspections shall be conducted by a team composed of the director of facilities or equivalent, the building's custodian or equivalent and a code enforcement official, and any other

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individuals so designated by the district. A code enforcement official is anyone who has completed the Basic Code Enforcement Training Program conducted by the Department of State.

The visual inspection shall be conducted in accordance with the attached Guidelines for Visual Structural Inspections of Student Occupied Public School Buildings. It should be noted that this visual inspection phase of the process **does not require** the services of a licensed architect or engineer.

The visual inspections must be completed by June 30 of each school year and reports of these inspections made available for public inspection upon request. These inspection reports shall be retained in school district files for six years after the building no longer exists, but not less than twenty-one years, whichever is longer.

**ARCHITECT/ENGINEER INVESTIGATION**

If the visual inspection indicates a possible defective structural condition, a licensed architect or engineer shall be retained **immediately** to evaluate the deficiency and determine if structural modifications are necessary. The architect or engineer will present a written report of all findings to the Board of Education. The Board will take appropriate action, if necessary, to correct any deficiencies. A copy of the report should also be submitted to the District Superintendent.

Any questions concerning this process may be directed to the staff of the Facilities Planning Office at (518) 474-3906.

# INTERIM GUIDELINES
# FOR
# VISUAL STRUCTURAL INSPECTIONS
# OF
# PUBLIC SCHOOL DISTRICT
# STUDENT OCCUPIED BUILDINGS
# October 1998

## VISUAL STRUCTURAL INSPECTION PROCESS

### PURPOSE OF THE VISUAL STRUCTURAL INSPECTION

An annual visual inspection of all student occupied public school buildings owned by a public school district is required by Education Law section 409-d,e, as added by Chapter 55 of the Laws of 1998. The purpose of the visual structural inspection is to identify conditions which may be indicative of structural deficiencies before such deficiencies pose a safety threat, and to determine if a more detailed inspection by a licensed architect or engineer is warranted. Conditions such as evidence of settlement or deflection or movement, large open cracks, water damage, loose/missing mortar, or loose masonry may be the precursor of a future problem.

The inspection team is not expected to make a judgement as to whether a condition is or is not a structural problem, but rather, to list these conditions which the team feels should be investigated by an architect or engineer. The visual inspection shall consist of observation of conditions in all rooms and readily accessible spaces. No demolition, cutting or excavation is intended to allow observation of conditions in concealed spaces, nor is the visual inspection intended to allow certification that the building is free of any structural deficiencies.

The inspection must be conducted prior to June 30 of each year. When a possible defective structural condition is discovered, an architect or engineer shall be retained to conduct an in-depth study.

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## STEPS FOR PERFORMING A VISUAL STRUCTURAL INSPECTION

### Step 1 SELECT A STRUCTURAL INSPECTION TEAM

Structural inspection teams, as a matter of law, shall include the following members:

- the director of facilities or equivalent;
- the building head custodian or equivalent; and
- a code enforcement official.

A code enforcement official is anyone who has successfully completed the Basic Code Enforcement Training Program prescribed by Section 434.6 of 19 NYCRR 434 of the minimum standards for code enforcement personnel in the State of New York. It should be noted that the services of an architect or engineer **are not required** for the initial visual inspection. Any person employed by a public entity, such as a public school district, and performing the inspection as part of their specified work duties is protected from personal liability by the *Public Officer's Law*. The Public Officer's Law covers any error, omission, or lack of thoroughness in the performance of the inspection and the report required by the law.

The school district administration may at their discretion allow other interested parties such as parents, members of the community, taxpayers and teachers to accompany the inspection team.

### Step 2 GATHER INSPECTION MATERIALS TOGETHER AND SCHEDULE AN INSPECTION

The first inspection materials to have on hand are these *Guidelines for Visual Structural Inspections of Public School District Student Occupied Buildings*. The visual inspection shall be conducted within the parameters of these guidelines. In school districts in cities having 125,000 inhabitants or more, the visual inspections may be conducted in accordance with standards established by the Board of Education and which have been approved by the Commissioner of Education.

The inspection materials should also include schematic building plans and a room schedule. Every building should have schematic plans available from the AHERA program. Schematic plans should indicate rooms, doors, windows, walls, corridors and exits. Elevation drawings are very helpful for the exterior inspections. All rooms and spaces should be numbered in advance of the inspection. Separate stair halls at floor lines. If plans or elevations are unavailable, the district may have the necessary expertise available through its district staff to produce such plans but, if not, outside assistance may be necessary. An architect or engineer would be appropriate for consultant services of this nature.

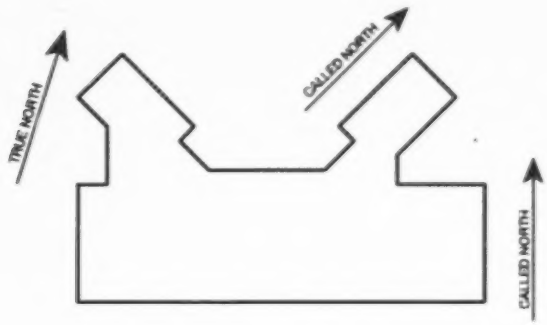
The State Education Department does have some definite recommendations as to the elements of these floor plans such as size and scale. These are as follows:

Small scale, architectural quality plans should be developed for each floor, or

level, of each building. The plans should be of a scale not less than 1/32"=1'-0" and not more than 1/16"=1'0". The plans should be of sufficient detail to show each and every space in the building and the door(s) or other access to the space.

The size of the drawings should be 8 1/2" x 11". Drawings may be extended by multiples of 8 1/2" x 11".

Every floor plan should indicate the direction of North. If the building does not readily orient with true north, then a direction "called north" must be selected and indicated on the plan. This is illustrated below.




A numbering system has been developed by the State Education Department which may be used when numbering individual spaces. A five-digit number is used to identify each space. These five digits are described below.

Digit 1: This represents the floor, or level, of the building where the space is located, with #1 meaning the lowest level and higher levels being numbered consecutively.

Digits 2, 3, and 4: Each individual space on each floor plan would be numbered consecutively beginning with 001. This would allow for 999 spaces per each level of each building. These include accessory spaces, such as closets, toilets, storerooms, corridors, mezzanines, etc.

Digit 5: This is an alpha character rather than a number. This alpha character would be used to represent accessible building service areas, such as pipe spaces, spaces above ceilings, access spaces, and under floor crawl spaces, and would be labeled consecutively in alphabetical order (A, B, C, etc.). The letter would follow the 2, 3 and 4 digits used to designate the space from which the service area is accessible through access panels or access doors, or drop panels in ceilings.

Each team should develop inspection forms. The form should allocate space for the following information:

- name, type and location of building inspected
- date and time of inspection
- description and location of possible structural deficiencies
- reference to related backup material, including but not limited to, schematic plans, elevations, and photographs

Records of each inspection shall be retained in district files for six years after the building no longer exists, but not less than twenty-one years, which ever is longer.

The following tools are helpful in conducting visual inspections:

- Binoculars
- Camera
- Knife
- Ladder
- Level
- Measuring tape

### Step 3 PRE-INSPECTION MEETING

The inspection team should meet prior to the inspection to discuss the scope of the inspection and these guidelines. The inspection forms, and plans and elevations should be on hand. Please note that **all instructional** buildings owned by the district must receive an annual visual structural inspection. The school representative must be prepared to provide access to all spaces, including concealed spaces which are readily accessible. Team members aware of areas that require specific observation should identify these areas to the other team members.

The team should also discuss the inspection route. One possible inspection route is to start on the roof and work down to the basement. Each area or room should be checked off on the plan as it is inspected.

## Step 4 VISUALLY INSPECT THE BUILDING ELEMENTS RELATED TO STRUCTURAL INTEGRITY

The scope of a visual inspection should include all building elements that affect structural integrity. The scope of the visual inspection includes but is not limited to the following:

Building Exterior
- walls
- chimneys
- retaining walls
- doors
- windows
- fire escapes and exterior stairs

Roof

Building Interior
- ceiling
- walls
- floors
- doors
- interior finishes
- stairs

Structural Elements
- footings and foundations
- floor slabs
- bearing and nonbearing walls
- columns
- beams
- connections between structural elements
- joists
- trusses
- centering

A. Building Exterior Inspection

Walk around and examine the entire exterior of the building. Use binoculars to observe high walls. When a problem is noted, properly identify the location (such as, parapet wall above main entry) and record the problem (such as, "twenty-five foot section of parapet wall bowed outward 8 inches.) Use of photographs is highly recommended, wherever possible.

Describe cracks (record them under the wall which appears to have moved, such as, "crack in center of east wall- crack open 1/8" from base of wall to 1 foot below ceiling.") Always state width and length of crack. Wherever possible examine structural elements such as, columns, girders, beams etc. If any defect or settlement is noted, look for a related

effect on floors above.

Hairline cracks (especially in the interior wall/ceiling finishes and concrete slabs) are not necessarily an indication of a structural problem. These cracks should be noted and observed regularly for signs that they are worsening. Open cracks, however, are always a concern.

Observe:

a. Walls, including copings, cornices, parapets, chimneys, spandrels for:

- evidence of movement, settlement, deflection;
- evidence of water penetration;
- evidence of loose masonry, spalling masonry, open masonry joints, loose mortar, cracks, bulging, offsets;
- evidence of ground settling adjacent to building;
- evidence of water running towards building or ponding near building.

b. Retaining walls for:

- evidence of loose masonry, spalling masonry, open masonry joints, cracks, bulging, offsets;
- evidence of movement, settlement, deflection.

c. Doors for:

- evidence of movement in relationship to wall and plumbness of opening;
- structural integrity of lintels – cracks, corrosion, corrosion;
- evidence of water penetration.

d. Windows for:

- evidence of movement - plumbness of opening;
- structural integrity of lintels, spandrels, sills, cracks, corrosion;
- evidence of water penetration.

e. Fire escapes and exterior stairs. It is strongly recommended that fire escapes be inspected by senior structural engineer and reinspected as recommended by the senior structural engineer. Look for:

- Anchor bolts securing the fire escape or ladder to the building which are not securely anchored to the building;

- Missing, bent or loose stair treads, platforms and/or ladder rungs;

- Structural members welded only at the bottom and not at the top thus causing water to be trapped and cause a buildup of rust between structural elements;

- Signs of rust jacking, the buildup up of rust between structural elements, which can cause welds and bolts to fail and structural elements to bend and warp.

B. Roof inspection

A roof is one of the most important parts of a building. The roof is the building element most responsible for keeping water out of the building. Entry of water into the building envelope can be a major cause of structural problems. Therefore, it is important to observe all roof surfaces, as well as flashings and parapets. Roof plans, if available, are helpful.

Look for:

- evidence of movement - torn membrane and/or flashings, loose copings or open cracks at parapet walls and flashings, moisture penetration;

- evidence of deteriorating substructure - soft spots;

- evidence of low points in areas away from drains- ponding, deflection, settlement, roof top mounted apparatus, appurtenances penetrating the deck;

- evidence of high points near drains;

- evidence of plugged drains or gutters;

Note all problems and describe location of problems.

C. Building Interior Inspection

Start at the top and work down. Visit rooms in a regular order and check off each room on the plan when completed to avoid omissions. Examine every room and space. Check all walls, floors and ceilings. Examine windows and doors for evidence of settlement, deflection, etc. Make note of problems only.

Observe:
a. Walls for:

- evidence of movement, settlement, deflection;
- evidence of water penetration.

b. Doors and windows for:

- evidence of movement - plumbness of opening;
- structural integrity of lintels – cracks, corrosion;
- evidence of water penetration.

c. Interior finishes - walls, ceilings, floors for:

- evidence of movement, settlement, deflection, spalling, cracks;
- evidence of water penetration;
- particular attention should be paid to suspended ceilings over pools and in other damp locations.

Record any separations between floors and trim on wall. Note floors and heads of doors and windows out of level. Note stairs out of level. Note signs of settlement. Record water stains on walls or ceilings. Key in notes on building plans.

Hairline cracks (especially in the interior wall/ceiling finishes and concrete slabs) are not necessarily an indication of a structural problem. These cracks should be noted and observed regularly for signs that they are worsening. Open cracks, however, are always a concern.

D. Structural Elements Inspection

Perform this in conjunction with the "Interior Inspection" noted above. In most cases the structural frame of the building will not be exposed. It may be possible to see some structural elements by looking into attics, above suspended ceilings and crawl spaces. Wherever possible examine girders and bearing surfaces of structural elements and all floor beams and joists, especially in wet or humid areas.

Observe:

a. Exposed portions of footings and foundations, including crawl spaces and basements for:

- evidence of settlement - cracks;
- evidence of deterioration - rust, spalling.

b. Floor slabs - on grade and above grade for:

- evidence of settlement or deflection - cracks;
- evidence of movement.

c. Bearing and nonbearing walls for:

- evidence of loose masonry, spalling masonry, open masonry joints, loose mortar, cracks, bulging, offsets;
- evidence of movement, settlement, deflection;
- evidence of water penetration;
- identification of unrestrained walls (vertical cantilevers).

d. Superstructure - columns, beams, joists, trusses, metal centering, etc. for:

- signs of internal rot in wood members (try poking knife through wood member. If knife can penetrate wood member there is a problem);
- evidence of deflection or movement;
- evidence of carpenter ants or termites in wood members (sawdust or termite tunnels);
- cracks.

e. Connections between structural elements

- loose, cracked or missing bolts;
- evidence of deflection or movement;
- cracks.

### Step 5 INSPECTION TEAM POST-INSPECTION CONFERENCE

The team should review their notes. Revisit those areas requiring a more detailed look. The team should reach a consensus about their observations. Concentrate on problem areas. Place the emphasis on documenting areas of concern about the building.

### Step 6 INSPECTION TEAM REPORT

The inspection team shall issue a report for each building which identifies:

- name, type and location of building inspected;
- date and time of inspection;
- possible structural deficiencies noted and requiring further study or testing; and
- backup material, including but not limited to, schematic plans, room schedules, and photographs.

The inspection report shall identify each inspector and shall be signed by **all** inspection team members. In addition, the code enforcement official shall include his code training registry number.

In cases of possible structural problems requiring further study by an architect or engineer, it will be helpful to provide the architect or engineer with the original or "as-built" construction plans and specifications.

## Step 7 SCHOOL BOARD REVIEW AND ACTIONS

The school board shall review the structural reports for each building. In the event that a visual inspection discloses evidence of a possible structural defect, a licensed architect or engineer shall be retained immediately to inspect the condition of the building and ascertain if structural modifications are necessary. The architect or engineer shall present a written report of all findings to the Board of Education, which shall act to correct any deficiencies. The Board shall notify the Office of Facilities Planning, Room 1060 Education Building Annex, State Education Department, Albany, NY 12234 immediately of any buildings noted as having "structural deficiencies."

**All structural deficiencies must be corrected as expeditiously as possible.**

Please note that all structural reports must be retained by the district for six years after the building no longer exists, but not less than twenty-one years, whichever is longer. A report needs to be filed and retained even when no structural deficiencies are found.

The State Education Department will keep a record of structural problems and advise districts if there appears to be a pattern of structural problems with a particular building design or building system.

## GLOSSARY OF TERMS:

### *Appurtenance*

An accessory part.

### *Bearing surface*

The surface of a structural member that supports another structural member such as, the bearing plate a column rests on or that portion of a masonry wall on which a beam rests.

### *Building envelope*

The exterior skin of the building consisting of the exterior walls, roof and floor.

### *Cantilever*

A projecting beam or member supported at only one end.

### *Centering*

Wooden or metal framework used in masonry and concrete construction. The centering is usually removed when the mortar or concrete is dry.

### *Column*

A vertical structural support member.

### *Coping*

Covering course on a wall usually with a sloping top. The coping is designed to keep water from entering the top of the wall.

### *Cornice*

The ornamental top course that crowns a wall.

### *Curtain Wall*

A non-load bearing wall which can be applied in front of a framed structure to keep out the weather. There are many types manufactured from a variety of materials such as aluminum, steel and glass. The section includes windows and the spaces in between which are called spandrels.

### *Deflection*

The sag or movement of a structural member due to a force, such as the sag in a floor when heavily loaded.

### *Elevation*

The external faces of a building; also a drawing showing one face of a building.

### *Flashing*

Sheet metal or plastic sheeting used in waterproofing roof valleys or hips or the angle between a wall and a roof.

### *Girder*

A horizontal main structural member that supports vertical loads and that consists of a single piece or more than one piece bound together.

### *Joist*

Any of the small timbers or metal beams ranged parallel from wall to wall in a structure to support a floor, roof or ceiling.

### *Lintel*

A horizontal member spanning and usually carrying the load above an opening, such as a door or window.

### *Parapet*

A low wall or railing to protect the edge of a roof.

### *Spalling*

The breaking off or chipping of masonry. Usually caused by water penetrating masonry and then freezing.

### *Spandrel*

The area above or below a window in a curtain wall. Usually, the spandrel is a metal panel or dark glass.

### *Truss*

An assembly of member forming a rigid framework to span between two points. Trusses are commonly used to support roofs and floors.